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10/782,027	02/19/2004	Ali Unal	370044-00002	4276

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EXAMINER

MORILLO, JANEL COMBS

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/782,027

Applicant(s)

UNAL ET AL.

Examiner

Janelle Combs-Morillo

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4-13, 15-18, 21, 22, 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun.

Sun teaches a process of manufacturing an aluminum alloy sheet stock (such as 3000 series, column 6 line 52), by continuously casting (column 2 lines 37-40) a strip with a thickness 0.01-0.2 in (column 3 line 26), hot rolling at a reduction of 15-99% (column 6 lines 39-40) to typically a thickness of 0.045 in, wherein said hot rolling occurs at temperatures between 300°F - solidus temperature (column 6 line 20) and an exit temperature of 600-1000°F (column 6 lines 17-19), and further annealing at 300-1200°F for 0.1-10 seconds (column 6 lines 24-25).

Concerning claims 1 and 8, Sun mentions that it is known in the art to water quench after casting and prior to working and further heat treating (column 2 lines 47-54). Sun teaches that said quench is a less efficient utilization of energy. However, it would have been obvious to one of ordinary skill in the art to quench after casting, as mentioned by Sun, because the prior art teaches that quenching after casting (though less energy efficient) achieves a strong dilute aluminum alloy because substantial precipitation has been prevented (column 1 lines 59-60). It is held that Sun has created a prima facie case of obviousness of the presently claimed invention.

Further concerning claim 1 and claim 9, though Sun does not specify “quenching” the feedstock to temperature of about 400-900°F between casting and before rolling. However, Sun teaches that hot rolling occurs at temperatures between 300°F -solidus temperature (column 6 line 20). Because said hot rolling temperature is < the temperature of casting molten aluminum, then Sun necessarily teaches cooling inbetween casting and hot rolling, wherein said cooling is to the hot rolling temperature, which overlaps the presently claimed range of 400-900°F.

Concerning claims 4 and 5, as stated above, Sun teaches casting at a thickness that substantially overlaps the presently claimed range.

Concerning claims 6, 7, and 10, with mention hot rolling parameters, as stated above, Sun teaches hot rolling at temperatures and gauges that substantially overlap the presently claimed ranges.

Concerning claims 11-13, 15-18, 28, 29, and 31, with mention anneal or solution heat treatment parameters, as stated above, Sun teaches (flash) annealing/solution heat treating (column 6 lines 22-23) at 300-1200°F for 0.1-10 seconds (column 6 lines 24-25), followed by quenching to below 550°F in order to retain alloying elements in solid solution (column 6 lines 28-29).

Concerning claim 21, Sun teaches said process can be performed on an AA3000 series alloy (column 6 lines 52-64, Ex.).

Concerning claim 22, Sun teaches the cast strip can be sent through a trim station (#5), which is prior to quenching (#8).

Concerning claim 27, though Sun teaches cold rolling after hot rolling, it would have been obvious to one of ordinary skill in the art to perform the process of working and heat

Art Unit: 1742

treating as taught by Sun, while not performing a step of cold rolling (which further reduces the sheet thickness) if the known effect of said cold rolling is not desired.

Omission of a step or element and its function is obvious if the function of the step or element is not desired or required, MPEP 2144.04, Ex parte Wu, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989). See also In re Larson, 340 F.2d 965, 144 USPQ 347 (CCPA 1965) (Omission of additional framework and axle which served to increase the cargo carrying capacity of prior art mobile fluid carrying unit would have been obvious if this feature was not desired.); and In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (deleting a prior art switch member and thereby eliminating its function was an obvious expedient). Note that the omission of an element and retention of its function is an indicia of unobviousness. In re Edge, 359 F.2d 896, 149 USPQ 556 (CCPA 1966).

Concerning claims 28, 30, and 32, Sun teaches a process of working and heat treating as presently claimed, including steps of annealing (column 5 lines 43-44) and coiling (column 5 line 51).

Because Sun teaches a method of casting, rolling, and heat treating an aluminum sheet substantially as presently claimed, it is held that Sun anticipates the instant invention.

3. Claims 1, 4-7, 9-13, 15-18, 21, 23, 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wyatt-Mair et al (US 5,514,228).

Wyatt-Mair teaches a process of manufacturing an aluminum alloy sheet stock by continuously casting (Fig. 4 and 5) a strip with a thickness 0.1-0.2 in (column 3 line 22), hot rolling to a thickness of typically 0.026 in (column 8 line 53), wherein said hot rolling exit temperature is 600-1000°F (column 7 lines 41-42), and further annealing at 600-1200°F for 0.1-

Art Unit: 1742

10 seconds (column 7 lines 43-45). Because the hot rolling exit temperature must be greater than the hot rolling temperature, it is held that Wyatt-Mair teaches hot rolling at temperatures >600-1000°F.

Concerning claim 1, 9, though Wyatt-Mair does not specify “quenching” the feedstock to temperature of about 400-900°F between casting and before rolling. However, Wyatt-Mair teaches hot rolling at temperatures >600-1000°F. Because said hot rolling temperature is < the temperature of casting molten aluminum, then Wyatt-Mair necessarily teaches cooling inbetween casting and hot rolling, wherein said cooling is to the hot rolling temperature, which overlaps the presently claimed range of 400-900°F.

The examiner points out that the instant claims do not mention a particular cooling/quenching rate or medium. Because the prior art teaches hot rolling occurs directly after casting, wherein said hot rolling occurs at temperatures overlapping the presently claimed quenching temperature of 400-900°F, it is held that Sun or Wyatt-Mair has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 4 and 5, as stated above, Wyatt-Mair teaches casting at a thickness that substantially overlaps the presently claimed range.

Concerning claims 6, 7, 10, and 23, with mention hot rolling parameters, as stated above, Wyatt-Mair teaches hot rolling at temperatures and gauges that substantially overlap the presently claimed ranges. Concerning claim 23, Wyatt-Mair teaches hot rolling in multiple stages (Ex. column 8).

Concerning claims 11-13, 15-18, 28-32, which mention anneal or solution heat treatment parameters, as stated above, Wyatt-Mair teaches (flash) annealing/solution heat treating (column

Art Unit: 1742

3 lines 9-10) at 600-1200°F for 0.1-10 seconds (column 7 lines 43-45), followed by water quenching to below 300°F in order to retain alloying elements in solid solution (column 7 lines 46-49).

Concerning claim 21, Wyatt-Mair teaches said process can be performed on an AA3000 series alloy (see Example), or any of the 1000, 2000, 3000, 4000, 5000, 6000, 7000, or 8000 series, column 8 lines 29-30).

Concerning claim 27, though Wyatt-Mair teaches cold rolling after hot rolling, it would have been obvious to one of ordinary skill in the art to perform the process of working and heat treating as taught by Wyatt-Mair, while not performing a step of cold rolling (which further reduces the sheet thickness) if the known effect of said cold rolling is not desired. Omission of a step or element and its function is obvious if the function of the step or element is not desired or required (MPEP 2144.04, see also above discussion).

Concerning claims 28, 30, and 32, Wyatt-Mair teaches a process of working and heat treating as presently claimed, including steps of annealing (an O type temper column 3 line 12) and coiling (Fig. 3).

Concerning claims 29 and 31 which mention solution heating in order to provide for a T type temper, Wyatt-Mair teaches solution heat treating (column 9 line 9).

Because Wyatt-Mair teaches a method of casting, rolling, and heat treating an aluminum sheet substantially as presently claimed, it is held that Sun has created a prima facie case of obviousness of the presently claimed invention.

Art Unit: 1742

4. Claims 1, 4-7, 9-13, 15-18, 21, 23, 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wyatt-Mair in view of Zonker et al (US 6,280,543). Wyatt-Mair is discussed in paragraphs above.

Zonker, who is drawn to producing thin sheets of 5000 and 6000 series alloys (see examples), teaches water quenching to room temperature before hot rolling and after continuous casting (column 5 lines 61-63, column 7 line 29) produces a product with high yield strength (column 6 lines 24-25, Table 2). It would have been obvious to one of ordinary skill in the art to perform a step of water quenching, as taught by Zonker, for the process of producing an aluminum sheet taught by Wyatt-Mair, because Zonker teaches that said quenching step produces a product with good yield strength (column 6 lines 24-25, Table 2). See above for discussion of dependent claims.

5. Claims 1, 4-13, 15-18, 21, 22, 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun in view of Zonker et al (US 6,280,543). Sun is discussed in paragraphs above.

Zonker, who is drawn to producing thin sheets of 5000 and 6000 series alloys (see examples), teaches water quenching to room temperature before hot rolling and after continuous casting (column 5 lines 61-63, column 7 line 29) produces a product with high yield strength (column 6 lines 24-25, Table 2). It would have been obvious to one of ordinary skill in the art to perform a step of water quenching, as taught by Zonker, for the process of producing an aluminum sheet taught by Sun, because Zonker teaches that said quenching step produces a product with good yield strength (column 6 lines 24-25, Table 2). See above for discussion of dependent claims.



Art Unit: 1742

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sun or Wyatt-Mair (optionally combined with of Zonker) in view of McAuliffe et al (US 5,106,429). Sun, Wyatt-Mair, and Zonker are discussed in paragraphs above.

Though Sun and Wyatt-Mair mention coiling said final sheet (Sun at column 5 line 52), Wyatt-Mair #12), neither mention tension leveling of the sheet. However, McAuliffe teaches that tension leveling cold rolled strip can be done to achieve a more uniform flatness (cl. 23, column 9 lines 11-14). It would have been obvious to one of ordinary skill in the art to tension level prior to coiling the aluminum strip taught by Sun or Wyatt-Mair, because McAuliffe teaches that tension leveling achieves a more uniform flatness (cl. 23, column 9 lines 11-14).

7. Claims 14 and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Sun or Wyatt-Mair as applied to claims above (optionally combined with Zonker), in view of “ASM Handbook: Vol 4 Heat Treating” pp 851-857.

Neither Sun nor Wyatt-Mair teach the quench is a) a combination of water and air (cl. 14) or b) air (cl. 19).

However, “ASM Vol. 4 Heat Treating” teaches that air quenching is typically used for less quench sensitive alloys (p 851 column 2, 3<sup>rd</sup> full paragraph), while spray quenching (i.e. pressurized water, wherein the pressure is supplied by air) is used to achieve high quench rates and typically used in continuous heat treating of sheet (page 851, bottom column 1 - top column 2). It would have been obvious to one of ordinary skill in the art to apply a combination of air and water quenching, as taught by “ASM Vol. 4 Heat Treating”, at the quenching step taught by the prior art, because “ASM Vol. 4 Heat Treating” teaches said quenching media are suitable to produce a supersaturated solution used in the continuous heat treating of sheet (p 851) or it

Art Unit: 1742

would have been obvious to one of ordinary skill in the art to use air as the quenchant medium, because “ASM Vol. 4 Heat Treating” teaches less quench sensitive alloys can be sufficiently quenched and a supersaturated solution achieved by the use of only air (p 851).

8. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sun (optionally combined with Zonker). Sun and Zonker are discussed in paragraph above.

Sun mentions a as cast thickness of 0.01-0.2 inches, which is further hot rolled with a reduction of 15-99%, and optionally cold rolled with a reduction of 10-85%. Therefore, it is held that the final sheet thickness taught by Sun broadly overlaps the presently claimed range. Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility.

9. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun or Wyatt-Mair (optionally combined with Zonker) in view of Newton (US 5,833,775). Sun, Wyatt-Mair, and Zonker are discussed in paragraphs above.

Newton teaches additional cold rolling, annealing, and quenching steps can be applied to aluminum sheet stock (column 5 lines 49-64). In particular, Newton teaches that after said anneal, the sheet can be allowed to cool, or cooled with force at a higher cooling rate to temperatures of about 250°F (column 14 lines 5-13, 36-43). Newton teaches said sheet exhibits an earing of less than about 2% (abstract). It would have been obvious to one of ordinary skill in the art to add an additional working steps, such as cold rolling, as well as annealing and quenching thereafter, to the method of working and heat treating taught by Sun or Wyatt-Mair,

Art Unit: 1742

because Newton teaches that said steps help produce a sheet with an earing of less than about 2% (abstract).

Concerning claim 26, as stated above, Sun or Wyatt-Mair teach a final thickness of said aluminum alloy sheet within the presently claimed range.

***Response to Amendment/Arguments***

10. In the amendment filed on March 7, 2005 applicant amended claims 1, 6-11, 13, 16, 18, 22, 23, 25; added new claims 27-32, and submitted various arguments traversing the rejections of record.

11. Applicant's argument that the present invention is allowable over the prior art of record because the prior art does not teach quenching in-between casting and hot rolling has not been found persuasive. It would have been obvious to one of ordinary skill in the art to quench after casting, as mentioned by Sun, because the prior art teaches that quenching after casting (though less energy efficient) achieves a strong dilute aluminum alloy because substantial precipitation has been prevented (column 1 lines 59-60). Additionally, though the prior art does not specify "quenching" the feedstock to temperature of about 400-900°F between casting and before rolling, because the prior art teaches the hot rolling temperature is < the temperature of casting molten aluminum, then the prior art necessarily teaches cooling inbetween casting and hot rolling, wherein said cooling is to the hot rolling temperature, which overlaps the presently claimed range of 400-900°F (see rejections above).

12. Applicant's argument that the present invention is allowable over the prior art of record because the prior art does not teach a process for making a T or O temper alloy has not been

Art Unit: 1742

found persuasive. As stated in the rejections above, the prior art teaches steps of annealing or solution heat treating, thereby providing said temper conditions.

### ***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1742

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCM

May 31, 2005

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